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The U.H. Institute for Astronomy CCD Camera Control System

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The University of Hawaii Institute for Astronomy CCD Camera Control System consists of a NeXT workstation, a graphical user interface, and a fiber optics communications interface which is connected to a San Diego State University CCD controller. The UH system employs the NeXT-resident Motorola DSP 56001 as a real time hardware controller. The DSP 56001 is interfaced to the Mach-based UNIX of the NeXT workstation by DMA and multithreading. Since the SDSU controller also uses the DSP 56001, the NeXT is used as a development platform for the embedded control software. The fiber optic interface links the two DSP 56001s through their Synchronous Serial Interfaces. The user interface is based on the NeXTStep windowing system. It is easy to use and features real-time display of image data and control over all camera functions. Both Loral and Tektronix 2048x2048 CCDs have been driven at full readout speeds, and the system is intended to be capable of simultaneous readout of four such CCDs. The total hardware package is compact enough to be quite portable and has been used on five different telescopes on Mauna Kea. The complete CCD control system can be assembled for a very low cost. The hardware and software of the control system have proven to be quite reliable, well adapted to the needs of astronomers, and extensible to increasingly complicated control requirements.